PATENT ABSTRACTS OF JAPAN

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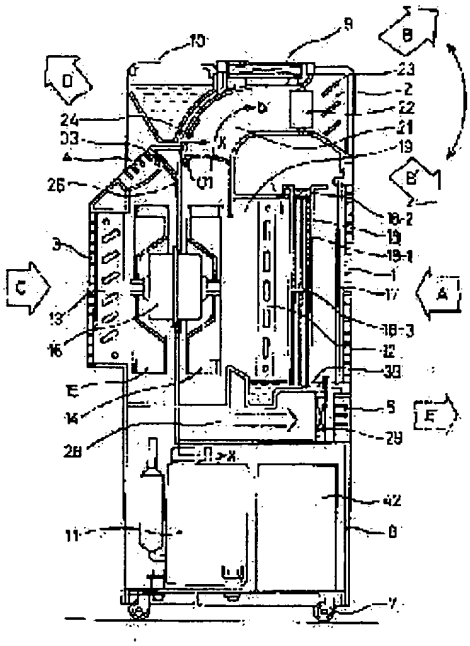
(54) MOBILE TYPE AIR-CONDITIONER

(57)Abstract:
PURPOSE: To select a most suitable air cooling operation device to perform operation by providing a first cooling operation device that makes an air cooling device work with a refrigerating machine, a second cooling operation device that makes an evaporation type cooling device work, and a third cooling operation device that brings the first and second cooling operation devices in operation simultaneously.
CONSTITUTION: An evaporator 12 that cools air using refrigerant, and a water evaporation type cooling device 18 that evaporates water and cools air based on the evaporation latent heat are installed in series on an air flow passage leading from an air suction port 1 to a cool air outlet 2. Three sorts of cooling operation devices, first, second and third ones, are provided. The first cooling operation device stops water supply to the cooling device 18 and brings a refrigerating machine 11 in operation to cool air, and the second cooling operation device stops the refrigerating machine 11 and supplies water to the cooling device 18 to cool air. The third cooling operation device brings the first and second cooling operation devices in operation simultaneously to cool air. A selector is provided to select one among the three cooling operation devices, so that a most suitable air cooling operation device can be selected corresponding to weather conditions and purpose of use to perform operation.



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* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The first air distribution channel from the first air-suction-system opening to the first air emission opening, and the second air distribution channel from the second air-suction-system opening to the second air emission opening, The low temperature side heat exchanger which cools the air which is prepared in said first air distribution channel, and circulates this first air distribution channel using the medium of a low-temperature condition, In the thing equipped with the elevated-temperature side heat exchanger which is prepared in said second air distribution channel, and cools the medium which is in an elevated-temperature condition using the air which circulates this second air distribution channel The ventilation means for circulating air along with said first air distribution channel, An evaporation type cooling means for it to be prepared in said low temperature side heat exchanger and a serial in said first air distribution channel, to contact the air which circulates this first air distribution channel for moisture, and to cool this air based on the latent heat of vaporization accompanying moisture evaporation, A first operation means to operate said low temperature side heat exchanger, and a second operation means to operate said evaporation type cooling means, The portable type conditioner characterized by having a control means with the third operation mode which operates to coincidence the first operation mode which operates only said first operation means, the second operation mode which operates only said second operation means, and said first operation means and said second operation means.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the portable type conditioner which combines in a detail the so-called cold blast fan function to which air quenching is carried out by moisture evaporation, and the cold blast machine function to perform air quenching using a refrigerator in the location of arbitration about the portable type conditioner which makes comfortable cold blast.
[0002]
[Description of the Prior Art] Conventionally, the so-called cold blast fan which are the common cold blast machine which is really which carried the refrigerator form air-quenching equipment as a portable type conditioner, and evaporation type cold blast equipment which cools the air which passes equipment based on the latent heat of vaporization of water is used. It is lightweight and both conditioners are equipped with migration means, such as a wheel and a handle, so that comfortable cold blast may be obtained in the location of arbitration. A cold blast machine dehumidifies, and it is constituted so that the water of condensation may be stored to the waste water tank prepared in the body lower part, while contacting the heat exchangers (evaporator etc.) and passage air which were cooled below at the dew point temperature of intake air, dropping temperature and blowing off as cold blast. As moisture mind that the humidification member (there is generally much shape of a broad endless belt) the cold blast fan had a member and permeability and water-refilling nature is moderate is held, air is circulated here, air-water contact is performed, and air temperature is dropped by the latent heat of vaporization of the moisture which evaporates into air, and it is constituted so that cold blast may be taken out.
[0003] Drawing 1 is the perspective view which looked at the typical appearance structure of a portable type conditioner (generally called a cold blast machine) where the conventional refrigerator was carried, from the transverse-plane slanting upper part, and drawing 2 is the perspective view seen from the tooth-back slanting upper part. In both drawings, the air incorporated from the air-intake 1 While it is prepared in a cooling air course, and it passes, contacting the low temperature side heat-exchanger (evaporator is usually used) front face maintained at the skin temperature below the dew point temperature and being cooled by heat exchange It condenses on a heat exchanger front face, and the steam contained in air serves as waterdrop, is dehumidified, can give the rate of flow with a blower fan, and blows off with vigor sufficient as cold blast from a diffuser 2. Moreover, it passes contacting the elevated-temperature side heat exchanger (a condenser is usually used) prepared in the exhaust heat air course, and the air which the exhaust heat air course for emitting exhaust heat of a refrigerator was established in equipment, and was incorporated from the air intake 3 is heated by heat exchange, serves as warm air, can give the rate of flow with a blower fan, and is emitted as hot blast from the exhaust heat exit cone 4. The wastewater container contained caudad is covered with the dehumidified water, and refrigerator operation is suspended while a warning lamp etc. will report, if it will be in flood condition. Output port 9 can be opened at this time, a wastewater container can be taken out, water can be thrown away, a wastewater container can be contained again, and operation can be continued.
[0004] the time of migration -- it handles and 6 and a wheel 7 are formed so that conveniently [raising]. actuation switches and a display collect into a control panel 9 -- having -- **** -- airflow (a little more than, inside, weakness, rhythm, etc.) besides the end actuation containing a power source, and wind direction -- it is constituted so that selection of swing, timer (right-and-

left, upper-and-lower-[redacted]es, auto, etc.) operations (an end t[redacted]r, entering timer, etc.), etc. and selection of operation mode (cold blast, dehumidification, ventilation) may make it make.

[0005] In order to use for the winter other than the above basic configuration and a function as a warm air machine, a plate-like ceramic PTC heater etc. is attached inside the cold blast diffuser 2 at a rockable cage. At the time of cold blast operation, it contains to the crevice established in the cold blast way, elegant flow loss and the noise are controlled, and it is also possible at the time of warm air operation to make it located in an air course, to heat the air which passes through this, and to blow off from the same diffuser 2 as warm air. Thus, the constituted air regulator was called in the name of "the machine of the coldness-and-warmth style", and is equipped with four sorts of operation modes (cold blast, dehumidification, ventilation, warm air). Among this, the operation mode with the highest availability is cold blast operation. When the cold blast engine performance at the time of cold blast operation is expressed with effectiveness (the amount of air-quenching sensible heat / the amount of exhaust heat), it is about about 40 - 45%. 25 - 30% is a part for the amount of dehumidification latent heat, and about 30% of the remaining items are a part for power (power) consumption.

[0006]

[Problem(s) to be Solved by the Invention] However, while cooling the inhaled air in the case of a cold blast machine and blowing off as cold blast, the heating value which added a part for the amount of heat of cooling with the power required in order to make cold blast must be emitted as exhaust heat. Since it is usually installed in the tooth-back side of a cold blast diffuser, those who are exposed to cold blast are not exposed to direct hot blast, but this exhaust heat diffuser is used in the interior of a room usually opened wide, in order that a room temperature may rise conversely and may not achieve an air conditioning function, when it is used in the closed interior of a room. Moreover, while blowing off cold blast, in order to dehumidify, a waste water tank is rapidly covered with water. However, since the room is opened wide, the open air invades, and even if it dehumidifies with much trouble, the humidity of the room does not fall.

[0007] A duct is attached in an exhaust heat diffuser, it connects with the stoma which prepared this duct in the aperture, and this situation does not change at all a means to shut the room and to emit exhaust heat to the outdoors. Although suction opening of an exhaust heat air course is prepared in some housings, and must connect a thick (the especially big air course cross section is the need for an absorption side) duct also to this suction opening and it must connect with the outdoors by two ducts, this is difficult in practice and it is because it is not used for reality in order to carry out phase conflict with the handiness of a portable type. For this reason, although the shut room space serves as negative pressure, the open air is inhaled too and neither a room temperature nor humidity falls, dehumidification will continue. A frozen load is the sum of the sensible heat load which descends air temperature, and the latent heat load to dehumidify, and both allocation has mainly become settled by the equipment design specification. For this reason, although only a temperature reduction is required and dehumidification is unnecessary when opening the room wide and using, the considerable part of power will be consumed by dehumidification and a part for this power will also be discharged as exhaust heat warm air.

[0008] Moreover, the room is opened wide, and since it is the operation which feels direct cool with cold blast, in spite of desiring large airflow [like / a fan], since a light weight's being calculated since it is a portable type, and exhaust heat control are called for, a small capacity refrigerator must be carried. Therefore, since a temperature reduction will decrease if airflow is increased, it is a few airflow air-conditioning machine fundamentally, and when a few is left, there is un-arranging [it becomes impossible to feel cool]. On the other hand, since there is the description whose power which cooling takes is zero on the theory in the case of a cold blast fan, there is un-arranging [to which attainment temperature is restricted with the relative humidity of the air which cooling effectiveness incorporated although large airflow was obtained often and easily]. That is, although atmospheric temperature is well cooled in the condition of having dried highly since the wet-bulb temperature of intake air turns into minimum temperature of cooling theoretically, sufficient cooling effect is not acquired in the humid condition.

[0009] A big temperature reduction is obtained with large airflow, and the place which it is made in order that this invention may solve the trouble mentioned above, and is made into the purpose is to choose the most suitable air-quenching means corresponding to a climatic condition and the purpose of use, and offer the portable type conditioner which can be operated, while carrying an

air-quenching means [redacted]which the big cold blast effectivene[redacted]s acquired, though it is little exhaust heat in power saving.

[0010]

[Means for Solving the Problem] It constitutes so that it may have an evaporation type cooling means cool that air based on the latent heat of vaporization by be use for said heat exchanger and serial in said air course , and evaporate moisture to the air which circulates that air distribution channel while this invention is equip with the heat exchanger for cooling which cools the air which circulates in accordance with this path in the air distribution channel which results in cooling air emission opening using a low-temperature medium from an air suction port in order to attain this purpose .

[0011] Furthermore, contain two kinds of cooling means which are different from each other in one housing, and supply of the moisture with which evaporation is presented in (1) evaporation type cooling means is refused. The 1st cooling driver stage which cools the air which operates a refrigerator and circulates said air course by said heat exchanger, (2) While operating the 2nd cooling driver stage which cools the air which suspends refrigerator operation, supplies the moisture with which evaporation is presented to said evaporation type cooling means, and circulates said air course, and (3) refrigerators Supply the moisture to an evaporation type cooling means, and it has the 3rd cooling driver stage which cools the air which circulates said air course by carrying out parallel running of the 1st cooling means and the 2nd cooling means. The selection means of the cooling driver stage for operating by choosing either of three sorts of these cooling driver stages is included.

[0012]

[Function] According to this invention which has the above-mentioned configuration, operation which was most suitable for various climatic conditions and purposes of use can be chosen. Although atmospheric temperature is high as the first example in the daytime [of the midsummer which cleared up well], humidity is comparatively as low as 50 - 60%. if the room is opened wide and it operates in the 2nd cooling driver stage (cold blast by the latent heat of vaporization of water), when such -- slight power -- it is -- abundance -- low natural cold blast is obtained. If the 3rd cooling driver stage which cools by compounding with a refrigerator is chosen, still more powerful cold blast will be obtained. In this case, it is also possible to constitute so that the moisture lost by evaporation may be compensated with the moisture condensed by the heat exchanger, and if it carries out like this, troublesomeness, such as supply of water or wastewater of the water of condensation, will be mitigated.

[0013] As the second example, as for the dawn of summer, or Nighttime, humidity becomes sultry highly. When such, it is good to choose the 1st operation means or the 3rd operation means with the 2nd operation means, since effectiveness is low. although the difference among both is based also on the climatic condition at the time of operation -- cold blast capacity -- the product of a part for a temperature reduction, and airflow -- giving a definition (it differing from general refrigerating capacity) -- the 3rd operation means won overwhelmingly. the reason -- the 3rd cooling driver stage -- a dehumidification load -- **** -- although it is few, or a part or all of power that is consumed by dehumidification in the 1st cooling driver stage is assigned to cooling of air and big cold blast capacity is acquired since it becomes a negative load (the amount of evaporation > condensation), it is because the amount of exhaust heat hardly changes. In the portable type conditioner which contained the exhaust heat air course to the same housing, although a ratio (the amount of air-quenching sensible heat / the amount of exhaust heat) is an important engine-performance element, the 3rd cooling driver stage is a cooling means by which this ratio is very high. Moreover, although the amount of [which passes a heat exchanger part / of air] temperature reduction decreases almost in inverse proportion to airflow when airflow is increased, a part for the temperature reduction of air which passes an evaporative-cooling part is hardly influenced by airflow. That is, in the 3rd cooling driver stage, even if it increases airflow, a temperature reduction has the description which does not decrease so much. however -- if the relative humidity of blow-off air is measured -- the [intake air <] -- the [1<] -- since it becomes high in order of the 2<3rd **, the cooling driver stage of arbitration should be chosen by a climatic condition or the liking of people to be used.

[0014] As the third example, with high humidity, such as the rainy season, when atmospheric temperature is comparatively low, the room has been shut and the 1st cooling driver stage can

dehumidify. In this case airflow which circulates a cold blast can be lessened, heat exchanger skin temperature can be dropped to near 0-degreeC, most frozen loads can be assigned to a latent heat load (dehumidification load), and it can dehumidify efficiently.
[0015]
[Example] Hereafter, one example which materialized this invention is explained with reference to a drawing. Drawing 3 and drawing 4 are the perspective views showing the appearance of one example of the portable type conditioner which embodied this invention, drawing 3 is seen from the transverse-plane slanting upper part, and drawing 4 is seen from the tooth-back slanting upper part. Although explanation is omitted in order that the attached number may be equivalent to the number of the conventional portable type conditioner explained previously and may avoid duplication, the characteristic point of this example is explained below.
[0016] the wind direction which the cold blast diffuser 2 is formed in the corner section of the transverse-plane upper part unlike the conventional thing, and was prepared in this inside -- the big blowdown angle from about 45 slanting upper parts to 45 slanting lower parts is acquired with a guide vane, and a user can be exposed to sufficient cold blast to the face also with a posture [having stood near this machine]. This is very convenient although exposed to cold blast at the time of after bath. Although an air-intake 1 approaches the location inserted into the cold blast diffuser 2 and the warm air diffuser 5, and is arranged and we are anxious about the degradation by "surroundings lump of a wind", since the wind style from each diffuser has the high rate of flow, the effect is extent which can be disregarded. The warm air outlet 5 prepared in order to use it for winter as a warm air machine is arranged at the transverse-plane lower part. This is very convenient although a step is warmed in kitchen etc.
[0017] As for the exhaust heat sidewind way, the air-intake 3 and the diffuser 4 are brought together in the tooth-back side. An air current is separated an interior-of-a-room and outdoor side, invasion of the open air is controlled, and this purpose is in the point that sufficient room temperature descent can be obtained, when it is used on both sides of this opportunity in the room facing the outdoors with a glass door. Drawing 1 and the portable type cold blast machine of the conventional configuration shown in 2 will emit to outdoor the air incorporated from the interior of a room since the air-intake of an exhaust heat sidewind way was located in the side face of a body, there is much open air invasion to the interior of a room, and most room temperature descent is not obtained. Moreover, it is for suppressing elegant circulation friction loss while the reason for having carried out opening of the exhaust heat diffuser 4 toward the slanting upper part prepares an exhaust heat emission hole in a window frame, it shortens duct die length while it makes a duct angle of bend small, when connecting and using the exhaust heat diffuser 4 of here and this machine by the FUREKISHIBU exhaust air duct, and it mitigates the complicatedness of appearance.

[0018] It is translucent and the water supply container 10 the transparence which carried out the horseshoe-shaped configuration, or the water put into the interior appears is installed in the top face of a body. Water is supplied to this water to the evaporation type cooling means installed in the interior. The cooling method which is made to pass air with a blower conventionally while dipping the end of the evaporative-cooling support of the shape of a belt which combines permeability and water-refilling nature to the tank prepared in body lower space in the air conditioner (called a cold blast fan.) of the method which cools passage air by the latent heat of vaporization of water and carrying out the circulation drive of the belt-like support, and obtains cold blast is used.
[0019] However, if level with the water level of a water supply tub is broken by this structure, water or since it is supplied, the water of the bottom of the tank section will not newly interchange. Moreover, when taking out a tub in order to wash since belt-like evaporation support has entered in the tub, it cannot pull out simply. This activity removes the ** ME gold of a tub and the body covering section, a body is lifted and the complicated actuation separated and taken out is needed. For this reason, it is disagreeable ****** which that such washing is performed has in fact, and water becomes old, and putrefaction progresses, comes to release an offensive odor, and is not clean. [little] In the water service system by this example, since it is easy to be laid in the upper part of a body, for old water not to pile up in order that water may flow down and go from the water flow hole of a container pars basilaris ossis occipitalis, and to remove the whole container, cooling with always pure water is possible.
[0020] The central sectional view for explaining an·air course configuration to drawing 5 is shown,

and the central section view for explaining a water flow device configuration to drawing 7 is shown. Drawing 6 is the sectional view (X view Fig.) which looked at drawing 5 from the back of a blower fan 14 to the transverse-plane side, and expresses an air course configuration. Drawing 5 explains the passage of air. With the negative pressure of the cold blast side blower fan 14, the air incorporated from the air-intake 1 in the direction of an arrow head A is removed in the big and rough dust dust which passes the air filter 17 and is floating in air, and passes through the HAME ** rare **** evaporation support 18-1 in the water evaporation cooler style 18. In this example, the evaporation support 18-1 is using what many pinholes (diameter of 2-3mm) put on for hydrophilic sheet metal-like resin. While the evaporation support 18-1 is wet according to a water flow device, a moderate moisture mind is maintained by capillary tube pressure sucking of self. The structure of the water evaporation cooler style 18 is shown in drawing 8 . It mentions later about the structure and an operation. Although the air which passes through the water evaporation cooler style 18 uses as a steam the water which water was evaporated and evaporated from the carrier surface and incorporates it to the inside of self by air-water contact, since the latent heat (about 580 cal/g) which evaporation takes at this time is taken from air, the air itself is cooled. Subsequently, some steams are condensed, it dissociates as waterdrop, and the air which passed through this is dehumidified while it passes the evaporator 12 maintained at the low temperature which is the following cooling means and receives cooling by heat exchange.

[0021] The air which received two steps of cooling and became low temperature is inhaled by the blower fan 14. In this example, the sirocco fan of the diameter of macrostomia is used as a blower fan. In the air course 20 formed in the duct 20-1 and the fan outer-diameter section of a RASEN form, and the air inhaled from fan central opening is bent in the direction of an arrow head a by the continuing air course 21, as the rate of flow can be given and it is shown in drawing 6 by the wing of the fan outer-diameter section. Furthermore, as shown in the drawing 5 arrow head b, U-turn bending is carried out in the direction of a transverse plane, and it passes along the longitudinal-direction guide vane 22 and the vertical direction guide vane 23, and is emitted with sufficient vigor to the wind direction of arbitration in the direction of an arrow head B from the cold blast diffuser 2.

[0022] A characteristic place the flow of the direction of an elementary stream which meets the RASEN form duct 20-1 which flows an air course 20 in drawing 6 with this air course structure in an air course outlet part, after bending with the flow of the direction of facing up which passes along the main axis line of a blower fan 14 (or -- bending ******) When 90 abbreviation bending is performed in the direction of an equipment transverse plane in an equipment central plane of worm gear (flat surface of the sectional view of drawing 5) and it sees on this flat surface, it is having considered as passage which the air inhaled from the air-intake 1 makes a U-turn, and blows off from the upper diffuser 2. By carrying out like this, the absorption opening 1 and a diffuser 2 are arranged to an equipment transverse-plane core at right-and-left distribution, and cold blast does not incline toward one side by the longitudinal direction in a diffuser 2. This is an advantage desirable also from an appearance design to user-friendly things and coincidence.

[0023] Next, an exhaust heat sidewind way is explained. The air which be attracted by the blower fan 15 and incorporated in the direction of an arrow head C from the air-intake 3 prepared in the equipment tooth back center section serve as a condenser (elevated temperature side heat exchanger) , the air course 20-1 which perform heat exchange , can absorb and warm exhaust heat , be incorporate by the blower fan (same diameter sirocco fan of macrostomia) , can give the rate of flow , and do not illustrate , and flow which meet the RASEN duct of a configuration similarly . In the RASEN form duct outlet section , in an equipment central plane of worm gear (cross section flat surface of Fig. 5) , this flow be bend 45 abbreviation and emit in the direction of an equipment tooth back with sufficient vigor in the direction of an arrow head D from the exhaust air diffuser 4 at the same time it be bend in the direction of facing up which pass along the medial axis line of a blower fan 15 .

[0024] Next, a warm air sidewind way is explained. The air course change-over plate 24 is supported by the supporting point 01 by the outlet section of the cold blast way 20. Moreover, the air course switch plate 25 different from this is supported by the supporting point 02. When blowing off cold blast from a diffuser 2, the air course switch plate 25 is held in the continuous-line location shown in drawing 5 and drawing 6 . When blowing off from a diffuser 5 as warm air, both ******** rotate to the two-dot chain line location shown in drawing 5 and drawing 6 , and are supported in it. At this time, the air course shield 26 formed in the exhaust heat diffuser inside also rotates to

coincidence at the circ[redacted]ference of the supporting point 03, [redacted]ves to a two-dot chain line location, and prevents the exhaust air blowdown. Three rotation plates, such as this, are constituted so that it may position all at once to either of two positions, a continuous-line location and a two-dot chain line location, and may hold to it according to the limit switch device for the motor which it is mutually connected by the link mechanism which is not illustrated, and is not illustrated, a crank chain, and location detection. If the air course change-over plate 24 covers the flow to an air course 21 and the air course change-over plate 25 is wide opened in drawing 6 It passes along the exterior of the RASEN form duct 20-1, and passes along the hole which carries out opening to the lower right, it is bent 90 degrees in the direction of an equipment transverse plane, and passes along an air course 28, and a heater 29 is passed, and it is heated, it becomes [it becomes elegant to be shown by the two-dot chain line arrow head, and] warm air, and blows off from the warm air diffuser 5 in the direction of an arrow head E.

[0025] Although the method which carries out the rotation drive of the blower fan 15 for a blower fan 14 with the common motor 16 is taken in this example, it becomes possible [it is also possible to constitute so that it may separate into two motors and may drive, and / also operating at frozen high effectiveness by the time of refrigerator operation], while the air course shield 26 becomes unnecessary in this case. That is, it is because there is un-arranging [of the following] when one motor is used like this example. Although rotation of a motor 16 is made low and airflow is reduced with the control panel shown in drawing 14 when a breeze is specified by the airflow selecting switch, rotation of a blower fan 15 also falls to coincidence in this case, and the amount of exhaust heat sidewinds also falls. If the induction motor is usually used, the motor by which internal organs were carried out to the compressor 11 performs frequency conversion by an inverter circuit etc. and a rotational frequency is changed corresponding to the change in airflow, it is ideal, but a portable type air-conditioning machine is easy, and since it is the air-conditioning machine which can search for a cheap thing, it is difficult to use this means that becomes cost quantity.

[0026] For this reason, since the amount of circulating flow of the refrigerant which circulates through the inside of a frozen circuit with a compressor 11 hardly changes, the refrigerant condensation temperature in a capacitor becomes high with the refrigerant evaporation temperature fall in an evaporator. thus, the unloading according [when the temperature gradient of an elevated temperature and low temperature is expanded, refrigerating capacity declines, and] to airflow reduction and ******** -- it becomes things. In this case, especially the rise of condensation temperature will increase power consumption, in spite of the unloading by airflow reduction, power consumption will increase conversely and frozen effectiveness will be reduced. Such a problem is avoidable, if it constitutes using two blower fan driving motors so that the amount of exhaust heat sidewinds may be maintained. However, since cost becomes high, he is trying to share one motor with an appearance configuration becoming large in this example.

[0027] Next, an evaporation cooler style and a water flow device are explained using drawing 7 . As for the perspective view showing the structure of the evaporative-cooling device section (or you may also call it a humidifier style) where drawing 8 was constituted removable, the sectional view in which drawing 9 shows the structure of the solenoid valve for water flow, and drawing 10 , at least water shows the electronic circuitry for a detection device and detection. Drawing 11 is the perspective view showing the configuration of the water receptacle arranged at the evaporation cooler style lower part.

[0028] As shown in drawing 7 and drawing 9 , the water cutoff valve 32 is formed in the container lower part at the transparence or the translucent water supply container 8 which supplies the water with which evaporation is presented. The water cutoff valve 32 is opened and closed through diaphram 31 by the solenoid valve 30 arranged caudad, and is flowing down or cutting off water in water from the water flow opening 36. While the water supply container 8 opens a lid 8-1 and water supply is carried out, it **** at the time of washing so that it can remove from a body. Since the water which flowed out from the water flow opening 36 is isolated with diaphram, it flows down a solenoid valve 30 from the water flow opening 37 without NURA ******, and flows into the up sump part 18-2 of the evaporation cooler style 18. many pinholes 18-4 should put on in the base of this sump part -- it passes along a ****** cage and here, and it flows down, being spread by capillarity and soaking the evaporative-cooling support 18-1 in homogeneity mostly, while flowing down the evaporative-cooling support 18-1 arranged under it from the upper part, and the remaining water flows into the water receptacle section 39 arranged caudad.

[0029] As the water receptacle section 39 is shown in drawing 11 , it distinguishs between the depth, and collects sequentially from the deeper one, and the lower limit of the evaporative-cooling support 18-1 comes to be dipped in water. As for the water level of the water receptacle section 39, at least water is made for two-step detection according to the detection device 44. The detection device impressed direct current voltage to the electrode 44 which contacts water as this example shows to drawing 10 , and at least water used a means to detect, according to the flowing very small current. When a direct current is impressed to water, in the anode plate side 44-2 of an electrode, according to an electrolysis phenomenon, the amount of [corresponding to the electrochemical equivalent] mass dissolves in underwater, and an electrode receives consumption. In order to avoid this, the very small time amount transistor for several [about] microseconds was turned on at 1 time of the rate at 1 second, electrical-potential-difference impression was carried out to the electrode, and means to judge water level with collector potential in the meantime were taken. The judgment which avoided the anode plate elution of an electrode and was stabilized was attained by carrying out like this.

[0030] The flow chart of control of water level is shown in drawing 22 . Moreover, control of a solenoid valve 30 is preparing two or more combination of ON period and an OFF period rather than continues ON condition or an OFF condition regularly simply. Since the flow rate became size, at least water performed circumstantial judgment, such as the time of the detecting signal of a detection device, operation mode or a start up, and stability, and it constituted it so that a suitable flow rate (ratio of ON and OFF) might be chosen automatically, so that the ratio of ON period was high. A solenoid valve 30 is controlled by maximum on-duty until it detects H level which shows the high thing of water level first at the time of a start up (S6). After H level detection controls by minimum on-duty, and when L level which shows that water level is low is detected, it controls by middle on-duty. A means by which management even if it controls by minimum on-duty, when H level detection is not canceled in the setup time, or in case L level is not canceled in the setup time even if it controls by middle on-duty changes with operation modes is chosen (S7, S8). That is, a refrigerator is stopped, and it controls towards not reducing the amount of water flow in the second operation mode which performs only an evaporative-cooling means, and is made to control towards reducing the amount of water flow in the third operation mode which is refrigerator operation and compound operation of evaporative cooling.

[0031] When it becomes the water level more than H level, it flows into the wastewater container 42 through a flow broth and the drain hole 41 from the overflow recovery hole 40 prepared in the water receptacle section. Moreover, the water cutoff valve 35 is formed in the pars basilaris ossis occipitalis of the water receptacle section 39, and closing motion is performed at it by the solenoid valve 33 through diaphram 34. although delicate control is called for as the solenoid valve 30 for water flow was mentioned above -- the solenoid valve for wastewater -- only -- operation mode -- an open condition -- or it is regularly chosen in a closed state. That is, a closed state is chosen so that water may collect on the water receptacle section, when the second operation mode which performs evaporative cooling or humidification is chosen, and when the first operation mode (for example, dehumidification etc.) which does not use this is chosen, an open condition is chosen so that water may not collect.

[0032] the float lever 43 which was directed with the supporting point 04 and formed the float section in the opposite section when the wastewater container 42 was covered with the water discharged from a drain 41 and this water level went up -- buoyancy -- the direction of an arrow head -- the surroundings and a setup -- if water level is reached, the full-of-water detection limit switch 45 operates, and operation will be suspended, while making LED on a control panel 9 turn on and reporting. The user opened wastewater container output port 8, the wastewater container 42 was taken out, and water was thrown away, and when containing again, it constituted so that resumption of operation might be carried out on the same conditions as halt before.

[0033] Although control with delicate water flow actuation, especially upper solenoid valve is performed as explained above, the water with which this reason is supplied from (a) water supply container is used as much as possible effectively, controls the amount which bypasses without presenting evaporation and flows into a wastewater container as much as possible, and avoids frequent water supply and a wastewater activity. For this reason, it controls so that a flow rate decreases as much as possible.

(b) It is limited and the lower part near the water surface gets wet, ** of the capillary tube sucking

capacity (sucking height) of the evaporative-cooling support 18-1 is good, and it gets dry, so that it goes upwards. the upper part -- getting wet -- it is restricted to what spreads and gets wet, and the water which flows down from the water flow hole 18-4 serves as dryness feeling, when the on-duty of a solenoid valve 30 is low. If on-duty is recklessly increased in order to avoid this, before being spread, it will flow down to the water receptacle section 39.
(c) The evaporation to the inside of the air of moisture is proportional to an air-water touch area. If it gets dry, evaporation will be zero, but when it gets wet with BETTORI, there is little mist beam evaporation. When moisture mind is seen slightly [just before getting dry], it is in delicate control being called for so that the evaporation maximum by smaller amount of water -- evaporation serves as max -- may be obtained.
[0034] Although it explained that the solenoid valve 33 for wastewater should just continue open [simple] or a simple closed state first, when carrying out resumption of operation in the inside of a short time, or when repeating the key stroke for operation mode selection, the water stored in the water receptacle section will be vainly poured to a wastewater container after shutdown. A solenoid valve is maintained at a closed state until after (a) shutdown carries out setup-time progress, in order to avoid these. (b) Even when operation mode is switched to the mode not using water, maintain a solenoid valve at a closed state until it carries out setup-time progress. Which consideration is made.
[0035] Drawing 11 is a perspective view showing the configuration of the water receptacle section. Although the level difference is prepared in the depth, this reason is for the water of condensation dropped from an evaporator to prevent wetting the lower part of the evaporative-cooling support 18-1 at the time of dehumidification operation. Namely, although mostly prepared in the center section, when [of the direction of long Taira of the water receptacle section] a floor line is not level and leans, as for the water cutoff valve 35, water will remain at the edge. There is no level difference, and when shallow, evaporation charge will be wet with this residual water. Time amount is required, while consuming many feedwaters by the time the volume becomes large and it is stabilized in predetermined water level at the time of a start up although this point is avoided when a level difference is not prepared but it is made deep. The level difference was prepared in order to solve this. Moreover, the water receptacle surface used the curved surface so that it might be low and both ends might become high about the shape not of a straight line but a center section. This is because it considered so that suction opening of a blower fan 14 might not be plugged up while preventing that water overflows by **** at the time of equipment migration. Moreover, it applied to the side attachment wall from the pars basilaris ossis occipitalis, and the weir was established in ladder-like. This has played the role of the wave stop for preventing that water overflows at the time of migration.
[0036] A psychrometric chart compares the cooling engine performance of each operational status of coincidence compound operation ** of a refrigerator and an evaporation cooler style which is the (c) third operation mode here the case of the evaporation cooler style individual operation which is the (b) second operation mode the case of the refrigerator individual operation which is the (a) first operation mode. Drawing 12 is the psychrometric chart having shown the cooling engine performance in (a), and a shows the air condition point incorporated from an air-intake 1. c points are dew-points of this air, an evaporator is maintained at temperature lower than c points, and the air condition near the front face of being in contact with the evaporator is shown by d points. A change of state while passing an evaporator becomes a thing in alignment with segment a-d, and passes an evaporator by z points, and temperature-reduction **T degreeC absolute-humidity descent **X accomplishes it, and it blows off from a diffuser through an air course.
[0037] Drawing 13 is expressed including the case of a cooling method (b), although the case of a cooling method (c) is expressed. The air incorporated in the Condition a contacts the evaporative-cooling support 18-1, is incorporated to the inside of self by using the moisture as a steam, gives the latent heat for evaporation by the own temperature reduction, and is cooled. This change turns into change which tends toward the wet-bulb point b, moves along with segment a-b, and slips out of this by y points. At this time, it is increment **Xin temperature-reduction **T1 degreeC absolute humidity 1. It accomplishes. It is change in case this is a cooling method (b).
[0038] In the case of a cooling method (c), an evaporator is passed from these y points, and it receives re-cooling. The air condition near the front face of being in contact with the evaporator is expressed with d points like drawing 12 . Strictly, the d point location of drawing 12 and the d point

location of drawing 13 may be ****(ed) with the same point, although latter one is slightly located in the low-temperature section. The change at this time becomes a thing in alignment with the segment which connects y-d too, escapes from an evaporator by z points, is in temperature-reduction **T2-degreeC and the condition that absolute-humidity fall **X2 were added, respectively, passes along an air course, and blows off from a diffuser 2. Although both **T1 and **T2 have a the same sign and a part for a temperature reduction is added, **X1 and **X2 have a reverse sign and it offsets them mutually. The case of drawing 12 , and in the case of drawing 13 , although **h shows the enthalpy decrement of air and this value is equal to refrigerating capacity, this value is almost same value. If the above is unified, it can be said that a cooling method (c) is a cooling method which converted into the temperature reduction the heating value which it means that had offset a part for a dehumidification load by the temperature reduction by humidification (evaporation), and is spent on dehumidification.

[0039] Next, the various operation modes of this example are explained. While equipping with a cold blast diffuser and a warm air diffuser the location left to **, it has the evaporation cooler style other than the conventional refrigerator cooling. Since an evaporation cooler style humidifies to cooling and coincidence, it will be equipped with the humidification function. By combining this etc. mutually, it constituted as an air-conditioning machine equipped with eight sorts of operation modes. Drawing 14 is what showed the control panel, the lower berth serves as an actuation switch and the upper case serves as an LED display. From an upper case left, either of eight sorts of operation modes is chosen by the operation change-over switch of the lower berth, and it is indicated by LED.

[0040] When each operation mode is explained, "W cold blast" P1 is in compound cooling mode which is the third operation mode applicable to a cooling method (c), and the following "cold blast" P2 are in refrigerator independent cooling mode which is the first operation mode applicable to a cooling method (a). "Dehumidification" P3 is the mode which makes the engine speed of a blower fan 14 low, reduces airflow as water flow is stopped, a solenoid valve 33 is opened and a water receptacle is not covered with water, and dehumidifies by lowering the refrigerant evaporation temperature in an evaporator to near 0-degreeC. "Cold blast fan" P4 is in evaporation cooler style individual-operation mode which is the second operation mode applicable to a cooling method (b). "Ventilation" P5 is the mode which is made to rotate only a blower fan and is used in fan. A wind style blows off from the cold blast diffuser 2 above at the time of operation in five kinds of modes.

[0041] "Humidification" When operating in three kinds of modes, P6, "warm air" P7, and "humidification warm air" P8, as explained above, in drawing 5 and drawing 6 , the air course switch plates 24 and 25 are rotated to a two-dot chain line location, the wind style to the cold blast diffuser 2 is prevented, and it switches in the style of [to the warm air diffuser 5] a wind. "Humidification" P6 is the mode which blows off from a diffuser 5, after heating at a heater the air which stopped the refrigerator, let water flow to the evaporation cooler style, and received cooling in humidification and coincidence to absorption temperature, an EQC, or somewhat higher temperature. "Warm air" P7 is operation mode which stops a refrigerator and an evaporation cooler style, heats at a heater more than 60-degreeC, and blows off from the warm air diffuser 5. "Humidification warm air" Although P8 is almost the same as the "humidification" P6 mode, the difference stops heater power in the "humidification" P6 mode, and what is heated to extent which is not cold is differed in that it heats by full power more than 60-degreeC like the "warm air" P7 mode in the "humidification warm air" P8 mode.

[0042] A flow chart shows the detailed control approach of each operation mode explained above to drawing 23 from drawing 15 . Here, it attaches and explains to the control related to operation mode. The processing shown in drawing 19 is a first operation means to operate the operation means of a refrigerator and to operate a low temperature side heat exchanger. Since both the cold blast P2 which is the first operation mode, the cold blast fan P4 which is the second operation mode, and the W cold blast P1 which is the third operation mode aim at blowing off cold blast, it is the mode using cold blast opening (S1). Furthermore, in the case of the cold blast P2 mode and the W cold blast P1 mode, it is the mode using a compressor (S2). In the case of the cold blast fan P4 mode, in order not to use a refrigerator, it is the mode which does not use a compressor. When a compressor drives, a refrigerator operates and a low temperature side heat exchanger operates. The processing shown in drawing 20 is a second operation means to operate an evaporation type cooling means. In the case of the cold blast fan P4 mode and the W cold blast P1 mode, it is the

mode which uses water (S3). Both the cold blast P2 mode, the cold blast fan P4 mode, and the W cold blast P1 mode are the modes which do not use a heater (S4).
[Effect of the Invention] According to the portable type conditioner of this invention, like [it is ****** from having explained above and] The first operation mode which operates only a first operation means to operate the cold blast machine using a refrigerator, Since it has the control means with the third operation mode which operates to coincidence the second operation mode which operates only a second operation means to operate an evaporation type cooling means, and said first operation means and said second operation means A big temperature reduction is obtained with large airflow, though it is power saving and is little exhaust heat, while carrying an air-quenching means by which the big cold blast effectiveness is acquired, the most suitable air-quenching means corresponding to a climatic condition and the purpose of use is chosen, and operating is possible.

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Industrial Application] This invention relates to the portable type conditioner which combines in a detail the so-called cold blast fan function to which air quenching is carried out by moisture evaporation, and the cold blast machine function to perform air quenching using a refrigerator in the location of arbitration about the portable type conditioner which makes comfortable cold blast.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Conventionally, the so-called cold blast fan which are the common cold blast machine which is really which carried the refrigerator form air-quenching equipment as a portable type conditioner, and evaporation type cold blast equipment which cools the air which passes equipment based on the latent heat of vaporization of water is used. It is lightweight and both conditioners are equipped with migration means, such as a wheel and a handle, so that comfortable cold blast may be obtained in the location of arbitration. A cold blast machine dehumidifies, and it is constituted so that the water of condensation may be stored to the waste water tank prepared in the body lower part, while contacting the heat exchangers (evaporator etc.) and passage air which were cooled below at the dew point temperature of intake air, dropping temperature and blowing off as cold blast. As moisture mind that the humidification member (there is generally much shape of a broad endless belt) the cold blast fan had a member and permeability and water-refilling nature is moderate is held, air is circulated here, air-water contact is performed, and air temperature is dropped by the latent heat of vaporization of the moisture which evaporates into air, and it is constituted so that cold blast may be taken out.
[0003] Drawing 1 is the perspective view which looked at the typical appearance structure of a portable type conditioner (generally called a cold blast machine) where the conventional refrigerator was carried, from the transverse-plane slanting upper part, and drawing 2 is the perspective view seen from the tooth-back slanting upper part. In both drawings, the air incorporated from the air-intake 1 While it is prepared in a cooling air course, and it passes, contacting the low temperature side heat-exchanger (evaporator is usually used) front face maintained at the skin temperature below the dew point temperature and being cooled by heat exchange It condenses on a heat exchanger front face, and the steam contained in air serves as waterdrop, is dehumidified, can give the rate of flow with a blower fan, and blows off with vigor sufficient as cold blast from a diffuser 2. Moreover, it passes contacting the elevated-temperature side heat exchanger (a condenser is usually used) prepared in the exhaust heat air course, and the air which the exhaust heat air course for emitting exhaust heat of a refrigerator was established in equipment, and was incorporated from the air intake 3 is heated by heat exchange, serves as warm air, can give the rate of flow with a blower fan, and is emitted as hot blast from the exhaust heat exit cone 4. The wastewater container contained caudad is covered with the dehumidified water, and refrigerator operation is suspended while a warning lamp etc. will report, if it will be in flood condition. Output port 9 can be opened at this time, a wastewater container can be taken out, water can be thrown away, a wastewater container can be contained again, and operation can be continued.
[0004] the time of migration -- it handles and 6 and a wheel 7 are formed so that conveniently [raising]. actuation switches and a display collect into a control panel 9 -- having -- **** -- airflow (a little more than, inside, weakness, rhythm, etc.) besides the end actuation containing a power source, and wind direction -- it is constituted so that selection of swing, timer (right-and-left, upper-and-lower-sides, auto, etc.) operations (an end timer, entering timer, etc.), etc. and selection of operation mode (cold blast, dehumidification, ventilation) may make it make.
[0005] In order to use for the winter other than the above basic configuration and a function as a warm air machine, a plate-like ceramic PTC heater etc. is attached inside the cold blast diffuser 2 at a rockable cage. At the time of cold blast operation, it contains to the crevice established in the cold blast way, elegant flow loss and the noise are controlled, and it is also possible at the time of warm air operation to make it located in an air course, to heat the air which passes through this, and

to blow off from the same diffuser 2 as warm air. Thus, the constituted air regulator was called in the name of "the machine of the coldness-and-warmth style", and is equipped with four sorts of operation modes (cold blast, dehumidification, ventilation, warm air). Among this, the operation mode with the highest availability is cold blast operation. When the cold blast engine performance at the time of cold blast operation is expressed with effectiveness (the amount of air-quenching sensible heat / the amount of exhaust heat), it is about about 40 - 45%. 25 - 30% is a part for the amount of dehumidification latent heat, and about 30% of the remaining items are a part for power (power) consumption.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] The first operation mode which operates only a first operation means to operate the cold blast machine using a refrigerator, like [it is ****** from having explained above and] according to the portable type conditioner of this invention, Since it has the control means with the third operation mode which operates to coincidence the second operation mode which operates only a second operation means to operate an evaporation type cooling means, and said first operation means and said second operation means A big temperature reduction is obtained with large airflow, though it is power saving and is little exhaust heat, while carrying an air-quenching means by which the big cold blast effectiveness is acquired, the most suitable air-quenching means corresponding to a climatic condition and the purpose of use is chosen, and operating is possible.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, while cooling the inhaled air in the case of a cold blast machine and blowing off as cold blast, the heating value which added a part for the amount of heat of cooling with the power required in order to make cold blast must be emitted as exhaust heat. Since it is usually installed in the tooth-back side of a cold blast diffuser, those who are exposed to cold blast are not exposed to direct hot blast, but this exhaust heat diffuser is used in the interior of a room usually opened wide, in order that a room temperature may rise conversely and may not achieve an air conditioning function, when it is used in the closed interior of a room. Moreover, while blowing off cold blast, in order to dehumidify, a waste water tank is rapidly covered with water. However, since the room is opened wide, the open air invades, and even if it dehumidifies with much trouble, the humidity of the room does not fall.
[0007] A duct is attached in an exhaust heat diffuser, it connects with the stoma which prepared this duct in the aperture, and this situation does not change at all a means to shut the room and to emit exhaust heat to the outdoors. Although suction opening of an exhaust heat air course is prepared in some housings, and must connect a thick (the especially big air course cross section is the need for an absorption side) duct also to this suction opening and it must connect with the outdoors by two ducts, this is difficult in practice and it is because it is not used for reality in order to carry out phase conflict with the handiness of a portable type. For this reason, although the shut room space serves as negative pressure, the open air is inhaled too and neither a room temperature nor humidity falls, dehumidification will continue. A frozen load is the sum of the sensible heat load which descends air temperature, and the latent heat load to dehumidify, and both allocation has mainly become settled by the equipment design specification. For this reason, although only a temperature reduction is required and dehumidification is unnecessary when opening the room wide and using, the considerable part of power will be consumed by dehumidification and a part for this power will also be discharged as exhaust heat warm air.
[0008] Moreover, the room is opened wide, and since it is the operation which feels direct cool with cold blast, in spite of desiring large airflow [like / a fan], since a light weight's being calculated since it is a portable type, and exhaust heat control are called for, a small capacity refrigerator must be carried. Therefore, since a temperature reduction will decrease if airflow is increased, it is a few airflow air-conditioning machine fundamentally, and when a few is left, there is un-arranging [it becomes impossible to feel cool]. On the other hand, since there is the description whose power which cooling takes is zero on the theory in the case of a cold blast fan, there is un-arranging [to which attainment temperature is restricted with the relative humidity of the air which cooling effectiveness incorporated although large airflow was obtained often and easily]. That is, although atmospheric temperature is well cooled in the condition of having dried highly since the wet-bulb temperature of intake air turns into minimum temperature of cooling theoretically, sufficient cooling effect is not acquired in the humid condition.
[0009] A big temperature reduction is obtained with large airflow, and the place which it is made in order that this invention may solve the trouble mentioned above, and is made into the purpose is to choose the most suitable air-quenching means corresponding to a climatic condition and the purpose of use, and offer the portable type conditioner which can be operated, while carrying an air-quenching means by which the big cold blast effectiveness is acquired, though it is little exhaust heat in power saving.

[Translation done.]

MEANS

[Means for Solving the Problem] It constitutes so that it may have an evaporation type cooling means cool that air based on the latent heat of vaporization by be use for said heat exchanger and serial in said air course , and evaporate moisture to the air which circulates that air distribution channel while this invention is equip with the heat exchanger for cooling which cools the air which circulates in accordance with this path in the air distribution channel which results in cooling air emission opening using a low-temperature medium from an air suction port in order to attain this purpose .
[0011] Furthermore, contain two kinds of cooling means which are different from each other in one housing, and supply of the moisture with which evaporation is presented in (1) evaporation type cooling means is refused. The 1st cooling driver stage which cools the air which operates a refrigerator and circulates said air course by said heat exchanger, (2) While operating the 2nd cooling driver stage which cools the air which suspends refrigerator operation, supplies the moisture with which evaporation is presented to said evaporation type cooling means, and circulates said air course, and (3) refrigerators Supply the moisture to an evaporation type cooling means, and it has the 3rd cooling driver stage which cools the air which circulates said air course by carrying out parallel running of the 1st cooling means and the 2nd cooling means. The selection means of the cooling driver stage for operating by choosing either of three sorts of these cooling driver stages is included.

[Translation done.]

OPERATION

[Function] According to this invention which has the above-mentioned configuration, operation which was most suitable for various climatic conditions and purposes of use can be chosen. Although atmospheric temperature is high as the first example in the daytime [of the midsummer which cleared up well], humidity is comparatively as low as 50 - 60%. if the room is opened wide and it operates in the 2nd cooling driver stage (cold blast by the latent heat of vaporization of water), when such -- slight power -- it is -- abundance -- low natural cold blast is obtained. If the 3rd cooling driver stage which cools by compounding with a refrigerator is chosen, still more powerful cold blast will be obtained. In this case, it is also possible to constitute so that the moisture lost by evaporation may be compensated with the moisture condensed by the heat exchanger, and if it carries out like this, troublesomeness, such as supply of water or wastewater of the water of condensation, will be mitigated.
[0013] As the second example, as for the dawn of summer, or Nighttime, humidity becomes sultry highly. When such, it is good to choose the 1st operation means or the 3rd operation means with the 2nd operation means, since effectiveness is low. although the difference among both is based also on the climatic condition at the time of operation -- cold blast capacity -- the product of a part for a temperature reduction, and airflow -- giving a definition (it differing from general refrigerating capacity) -- the 3rd operation means won overwhelmingly. the reason -- the 3rd cooling driver stage -- a dehumidification load -- **** -- although it is few, or a part or all of power that is consumed by dehumidification in the 1st cooling driver stage is assigned to cooling of air and big cold blast capacity is acquired since it becomes a negative load (the amount of evaporation > condensation), it is because the amount of exhaust heat hardly changes. In the portable type conditioner which contained the exhaust heat air course to the same housing, although a ratio (the amount of air-quenching sensible heat / the amount of exhaust heat) is an important engine-performance element, the 3rd cooling driver stage is a cooling means by which this ratio is very high. Moreover, although the amount of [which passes a heat exchanger part / of air] temperature reduction decreases almost in inverse proportion to airflow when airflow is increased, a part for the temperature reduction of air which passes an evaporative-cooling part is hardly influenced by airflow. That is, in the 3rd cooling driver stage, even if it increases airflow, a temperature reduction has the description which does not decrease so much. however -- if the relative humidity of blow-off air is measured -- the [intake air <] -- the [1<] -- since it becomes high in order of the 2<3rd **, the cooling driver stage of arbitration should be chosen by a climatic condition or the liking of people to be used.
[0014] As the third example, with high humidity, such as the rainy season, when atmospheric temperature is comparatively low, the room has been shut and the 1st cooling driver stage can dehumidify. In this case, airflow which circulates a cold blast way can be lessened, heat exchanger skin temperature can be dropped to near 0-degreeC, most frozen loads can be assigned to a latent heat load (dehumidification load), and it can dehumidify efficiently.

[Translation done.]

EXAMPLE

[Example] Hereafter, one example which materialized this invention is explained with reference to a drawing. Drawing 3 and drawing 4 are the perspective views showing the appearance of one example of the portable type conditioner which embodied this invention, drawing 3 is seen from the transverse-plane slanting upper part, and drawing 4 is seen from the tooth-back slanting upper part. Although explanation is omitted in order that the attached number may be equivalent to the number of the conventional portable type conditioner explained previously and may avoid duplication, the characteristic point of this example is explained below.
[0016] the wind direction which the cold blast diffuser 2 is formed in the corner section of the transverse-plane upper part unlike the conventional thing, and was prepared in this inside -- the big blowdown angle from about 45 slanting upper parts to 45 slanting lower parts is acquired with a guide vane, and a user can be exposed to sufficient cold blast to the face also with a posture [having stood near this machine]. This is very convenient although exposed to cold blast at the time of after bath. Although an air-intake 1 approaches the location inserted into the cold blast diffuser 2 and the warm air diffuser 5, and is arranged and we are anxious about the degradation by "surroundings lump of a wind", since the wind style from each diffuser has the high rate of flow, the effect is extent which can be disregarded. The warm air outlet 5 prepared in order to use it for winter as a warm air machine is arranged at the transverse-plane lower part. This is very convenient although a step is warmed in kitchen etc.
[0017] As for the exhaust heat sidewind way, the air-intake 3 and the diffuser 4 are brought together in the tooth-back side. An air current is separated an interior-of-a-room and outdoor side, invasion of the open air is controlled, and this purpose is in the point that sufficient room temperature descent can be obtained, when it is used on both sides of this opportunity in the room facing the outdoors with a glass door. Drawing 1 and the portable type cold blast machine of the conventional configuration shown in 2 will emit to outdoor the air incorporated from the interior of a room since the air-intake of an exhaust heat sidewind way was located in the side face of a body, there is much open air invasion to the interior of a room, and most room temperature descent is not obtained. Moreover, it is for suppressing elegant circulation friction loss while the reason for having carried out opening of the exhaust heat diffuser 4 toward the slanting upper part prepares an exhaust heat emission hole in a window frame, it shortens duct die length while it makes a duct angle of bend small, when connecting and using the exhaust heat diffuser 4 of here and this machine by the FUREKISHIBU exhaust air duct, and it mitigates the complicatedness of appearance.

[0018] It is translucent and the water supply container 10 the transparence which carried out the horseshoe-shaped configuration, or the water put into the interior appears is installed in the top face of a body. Water is supplied to this water to the evaporation type cooling means installed in the interior. The cooling method which is made to pass air with a blower conventionally while dipping the end of the evaporative-cooling support of the shape of a belt which combines permeability and water-refilling nature to the tank prepared in body lower space in the air conditioner (called a cold blast fan.) of the method which cools passage air by the latent heat of vaporization of water and carrying out the circulation drive of the belt-like support, and obtains cold blast is used.
[0019] However, if level with the water level of a water supply tub is broken by this structure, water or since it is supplied, the water of the bottom of the tank section will not newly interchange. Moreover, when taking out a tub in order to wash since belt-like evaporation support has entered in

the tub, it cannot pull out simply. This activity removes the ** ME gold of a tub and the body covering section, a body is lifted and the complicated actuation separated and taken out is needed. For this reason, it is disagreeable ****** which that such washing is performed has in fact, and water becomes old, and putrefaction progresses, comes to release an offensive odor, and is not clean. [little] In the water service system by this example, since it is easy to be laid in the upper part of a body, for old water not to pile up in order that water may flow down and go from the water flow hole of a container pars basilaris ossis occipitalis, and to remove the whole container, cooling with always pure water is possible.

[0020] The central sectional view for explaining an air course configuration to drawing 5 is shown, and the central sectional view for explaining a water flow device configuration to drawing 7 is shown. Drawing 6 is the sectional view (X view Fig.) which looked at drawing 5 from the back of a blower fan 14 to the transverse-plane side, and expresses an air course configuration. Drawing 5 explains the passage of air. With the negative pressure of the cold blast side blower fan 14, the air incorporated from the air-intake 1 in the direction of an arrow head A is removed in the big and rough dust dust which passes the air filter 17 and is floating in air, and passes through the HAME ** rare **** evaporation support 18-1 in the water evaporation cooler style 18. In this example, the evaporation support 18-1 is using what many pinholes (diameter of 2-3mm) put on for hydrophilic sheet metal-like resin. While the evaporation support 18-1 is wet according to a water flow device, a moderate moisture mind is maintained by capillary tube pressure sucking of self. The structure of the water evaporation cooler style 18 is shown in drawing 8 . It mentions later about the structure and an operation. Although the air which passes through the water evaporation cooler style 18 uses as a steam the water which water was evaporated and evaporated from the carrier surface and incorporates it to the inside of self by air-water contact, since the latent heat (about 580 cal/g) which evaporation takes at this time is taken from air, the air itself is cooled. Subsequently, some steams are condensed, it dissociates as waterdrop, and the air which passed through this is dehumidified while it passes the evaporator 12 maintained at the low temperature which is the following cooling means and receives cooling by heat exchange.

[0021] The air which received two steps of cooling and became low temperature is inhaled by the blower fan 14. In this example, the sirocco fan of the diameter of macrostomia is used as a blower fan. In the air course 20 formed in the duct 20-1 and the fan outer-diameter section of a RASEN form, and the air inhaled from fan central opening is bent in the direction of an arrow head a by the continuing air course 21, as the rate of flow can be given and it is shown in drawing 6 by the wing of the fan outer-diameter section. Furthermore, as shown in the drawing 5 arrow head b, U-turn bending is carried out in the direction of a transverse plane, and it passes along the longitudinal-direction guide vane 22 and the vertical direction guide vane 23, and is emitted with sufficient vigor to the wind direction of arbitration in the direction of an arrow head B from the cold blast diffuser 2.

[0022] A characteristic place the flow of the direction of an elementary stream which meets the RASEN form duct 20-1 which flows an air course 20 in drawing 6 with this air course structure in an air course outlet part, after bending with the flow of the direction of facing up which passes along the main axis line of a blower fan 14 (or -- bending ******) When 90 abbreviation bending is performed in the direction of an equipment transverse plane in an equipment central plane of worm gear (flat surface of the sectional view of drawing 5) and it sees on this flat surface, it is having considered as passage which the air inhaled from the air-intake 1 makes a U-turn, and blows off from the upper diffuser 2. By carrying out like this, the absorption opening 1 and a diffuser 2 are arranged to an equipment transverse-plane core at right-and-left distribution, and cold blast does not incline toward one side by the longitudinal direction in a diffuser 2. This is an advantage desirable also from an appearance design to user-friendly things and coincidence.

[0023] Next, an exhaust heat sidewind way is explained.

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the transverse-plane perspective view of the conventional portable type conditioner which carried only the refrigerator.
[Drawing 2] It is the tooth-back perspective view of the conventional portable type conditioner which carried only the refrigerator.
[Drawing 3] It is the transverse-plane perspective view of the portable type conditioner which is one example of this invention.
[Drawing 4] It is the tooth-back perspective view of the portable type conditioner which is one example of this invention.
[Drawing 5] It is the sectional view of the portable type conditioner in which an air distribution channel is shown.
[Drawing 6] It is the configuration sectional view of the air course of cold blast.
[Drawing 7] It is the sectional view of the portable type conditioner in which the distribution channel of water is shown.
[Drawing 8] It is the perspective view showing the structure of an evaporation type cooling system.
[Drawing 9] It is the sectional view showing the configuration of water flow opening of a water feeder.
[Drawing 10] At least water is the block diagram of a detection device.
[Drawing 11] It is the perspective view of the water receptacle section.
[Drawing 12] It is the psychrometric chart showing the cooling engine performance in the case of the first operation mode.
[Drawing 13] It is the psychrometric chart showing the cooling engine performance the case of the second operation mode, and in the case of the third operation mode.
[Drawing 14] It is the front view of the panel of the portable type conditioner of this example.
[Drawing 15] It is the 1st flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 16] It is the 2nd flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 17] It is the 3rd flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 18] It is the 4th flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 19] It is the 5th flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 20] It is the 6th flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 21] It is the 7th flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 22] It is the 8th flow chart which shows control of the portable type air conditioning system of this example.
[Drawing 23] It is the 9th flow chart which shows control of the portable type air conditioning system of this example.
[Description of Notations]

1 Air-intake
2 Cold Blast Diffuser
4 Exhaust Heat Diffuser
10 Water Supply Container
14 Cold Blast Side Blower Fan
18 Water Evaporation Cooler Style
18-1 Water Evaporation Cooler Style
P1 W cold blast mode selection drop
P2 Cold blast mode selection drop
P4 Cold blast fan mode selection drop

[Translation done.]

* NOTICES *

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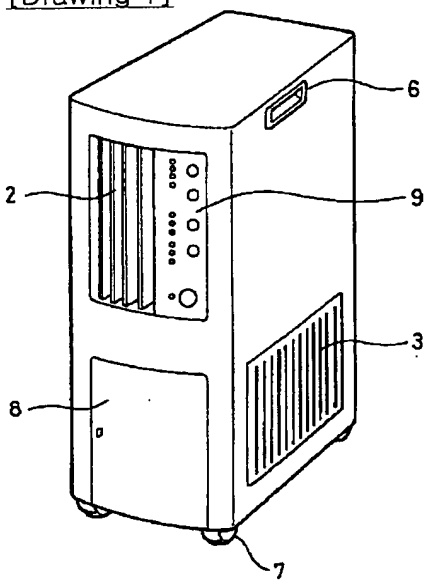
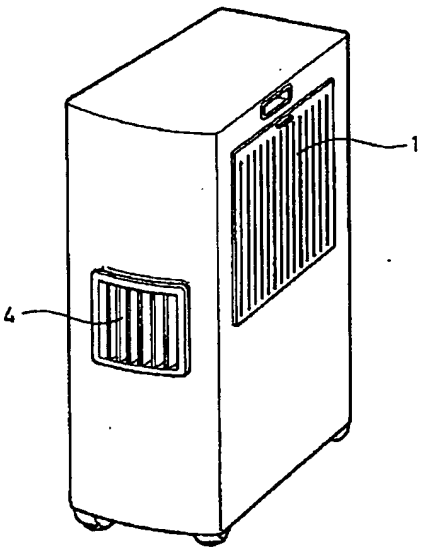
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

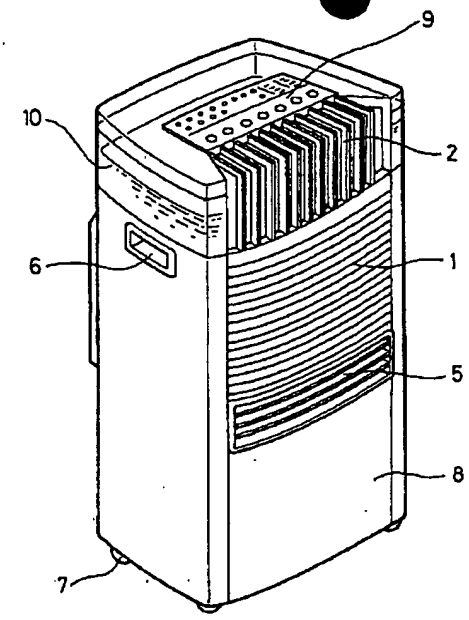
[Drawing 1]



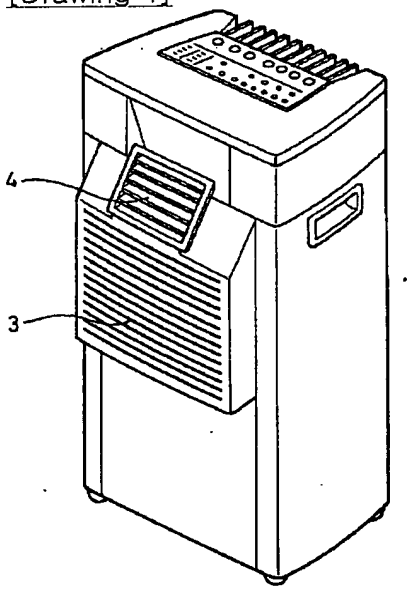
[Drawing 2]



[Drawing 3]



[Drawing 4]



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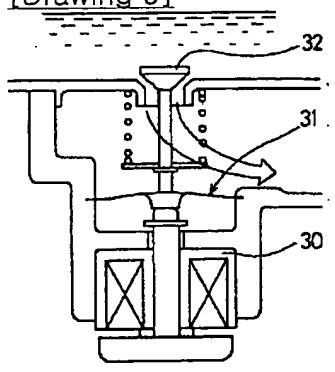
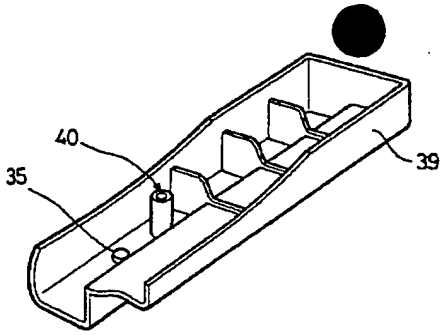


[Drawing 11]



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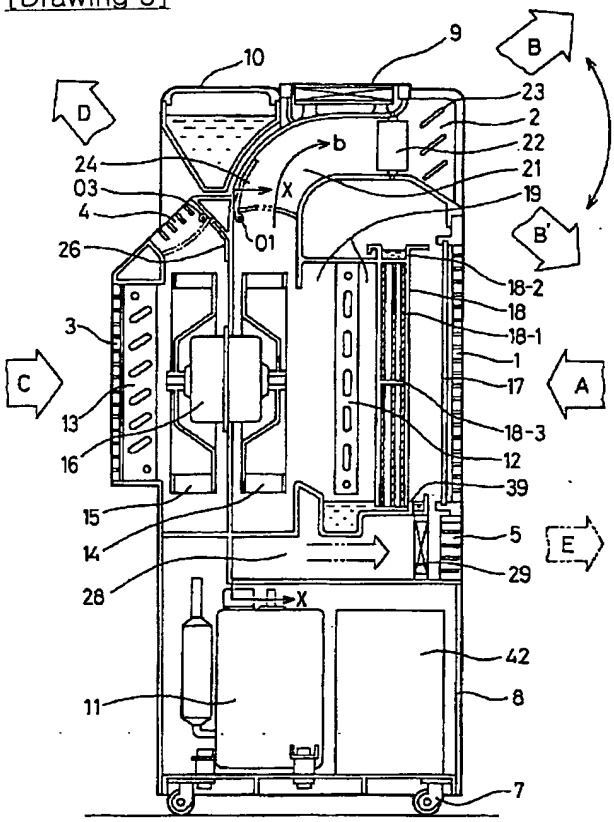

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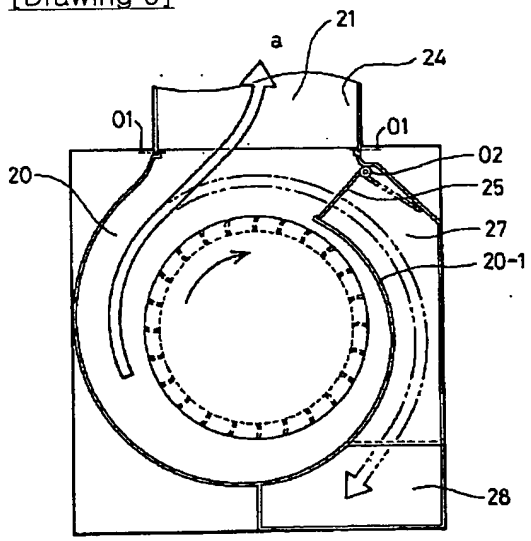

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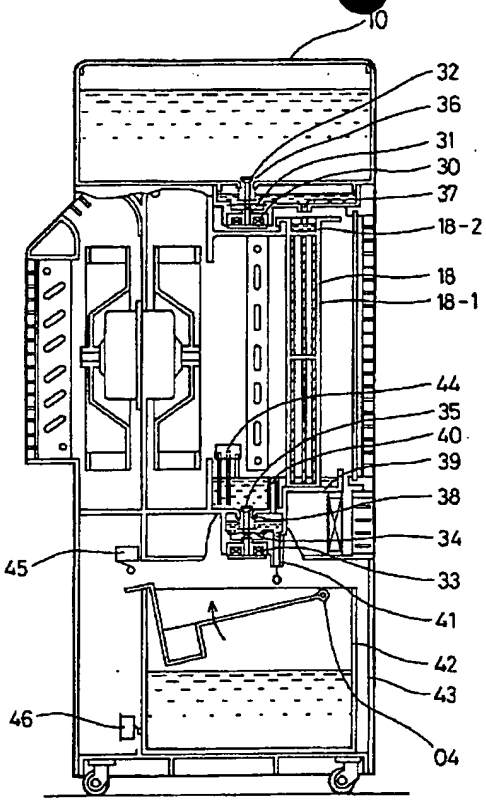
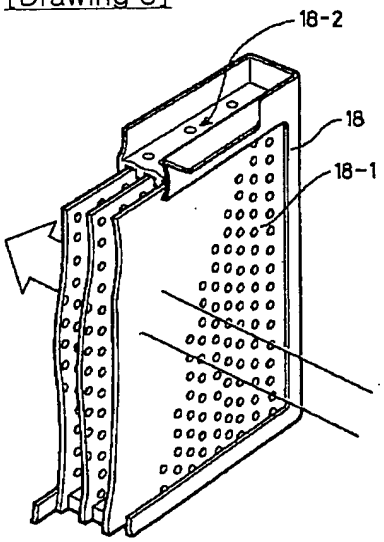
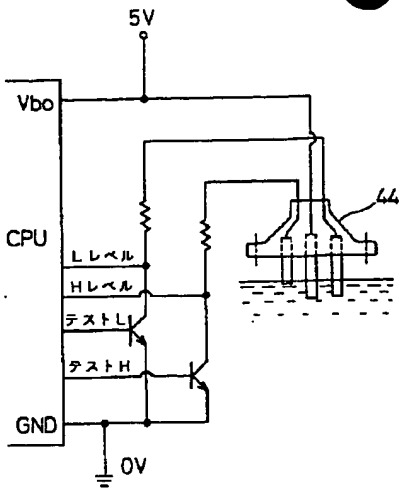


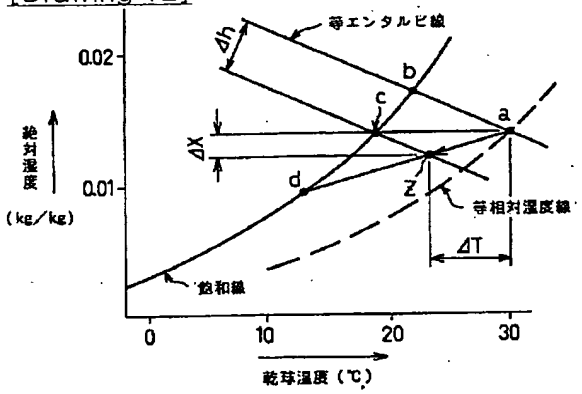
[Drawing 8]



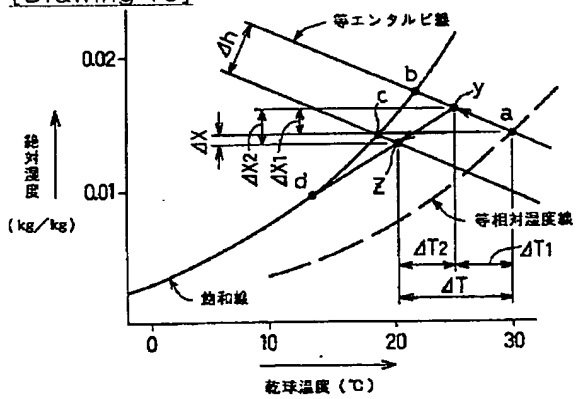
[Drawing 10]



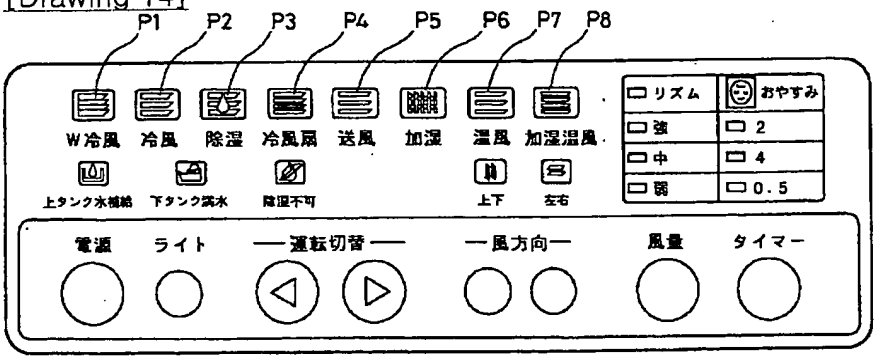
[Drawing 12]



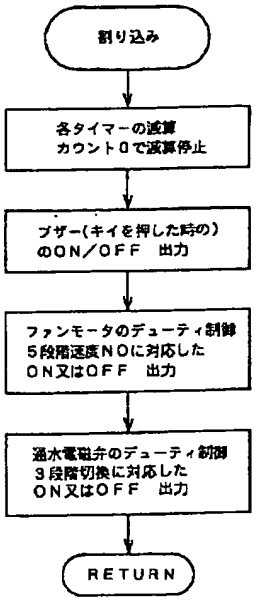
[Drawing 13]



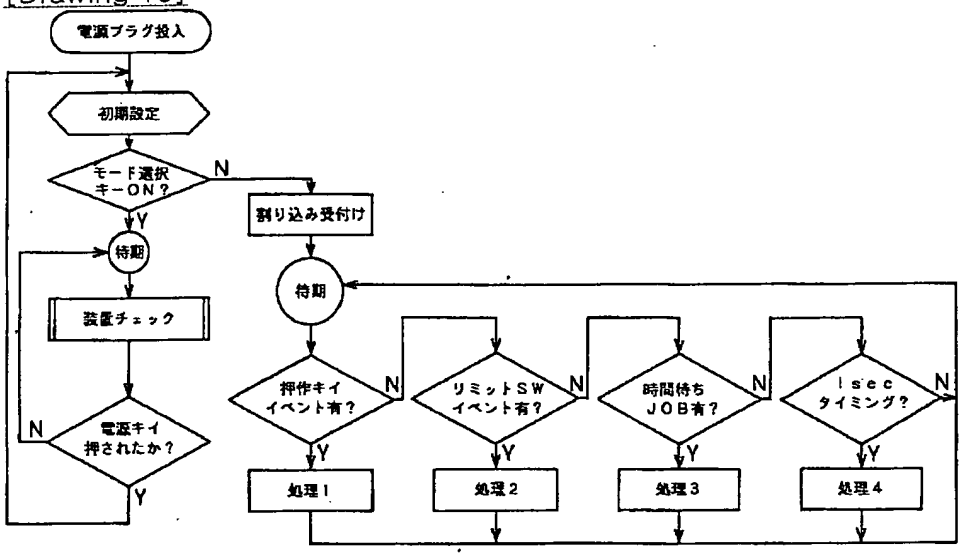
[Drawing 14]



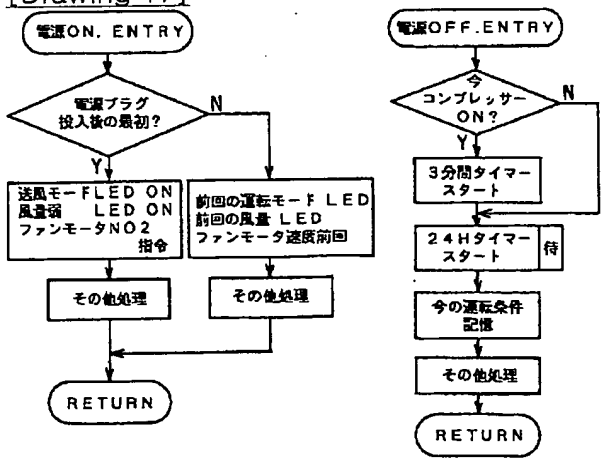
[Drawing 23]



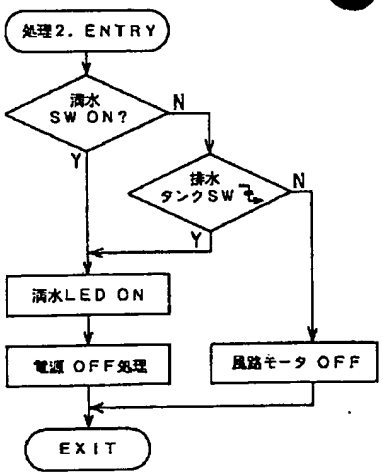
[Drawing 15]



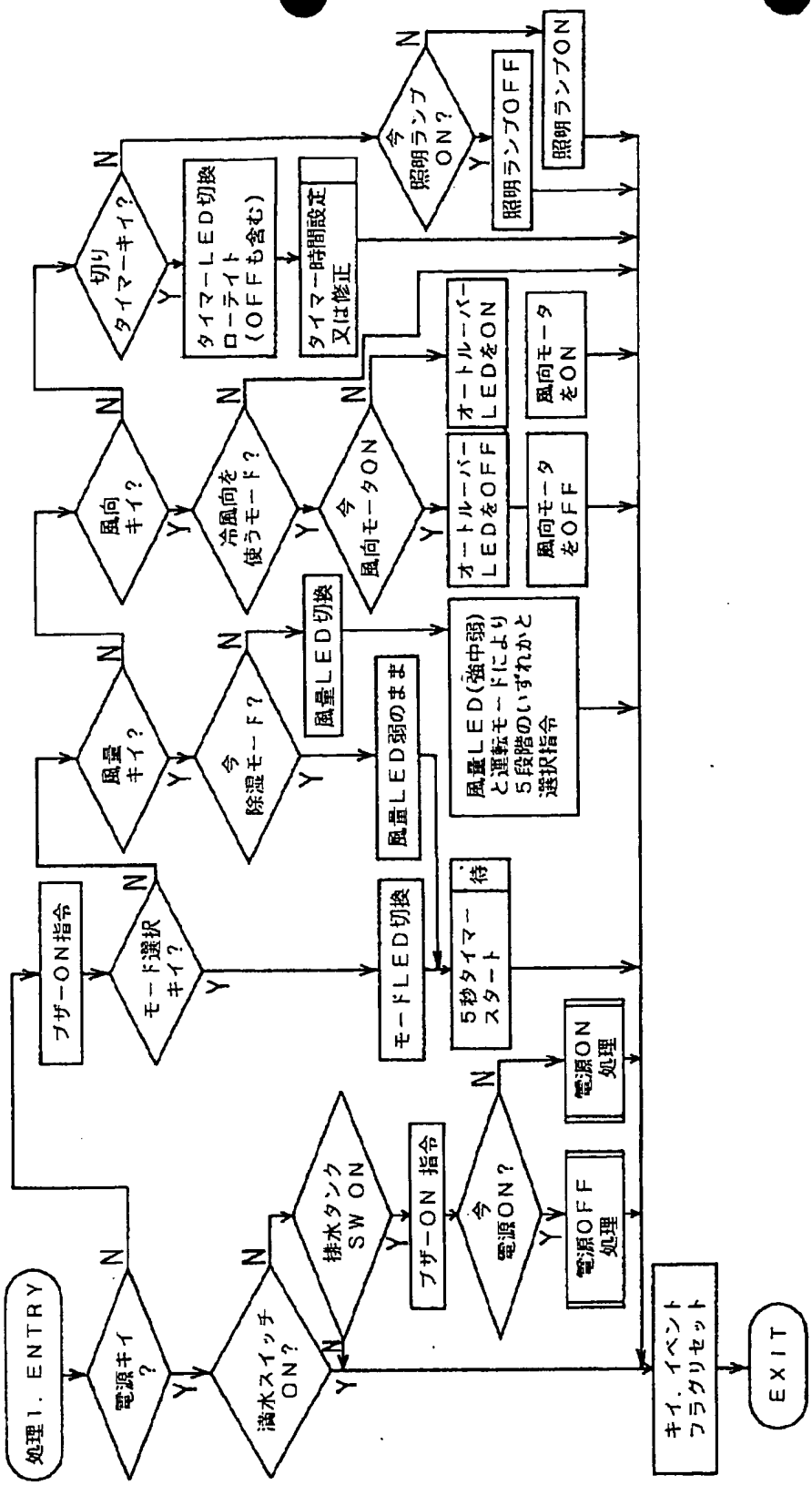
[Drawing 17]



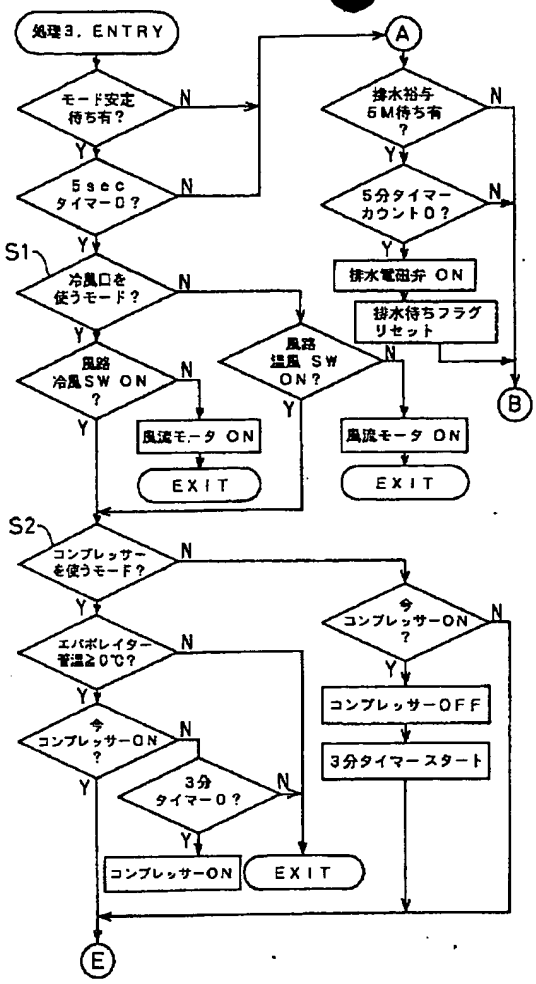
[Drawing 18]


処理2. ENTRY
満水
SW ON?
N
Y
排水
タンクSW ON?
N
Y
満水LED ON
電源 OFF処理
風路モータ OFF
EXIT

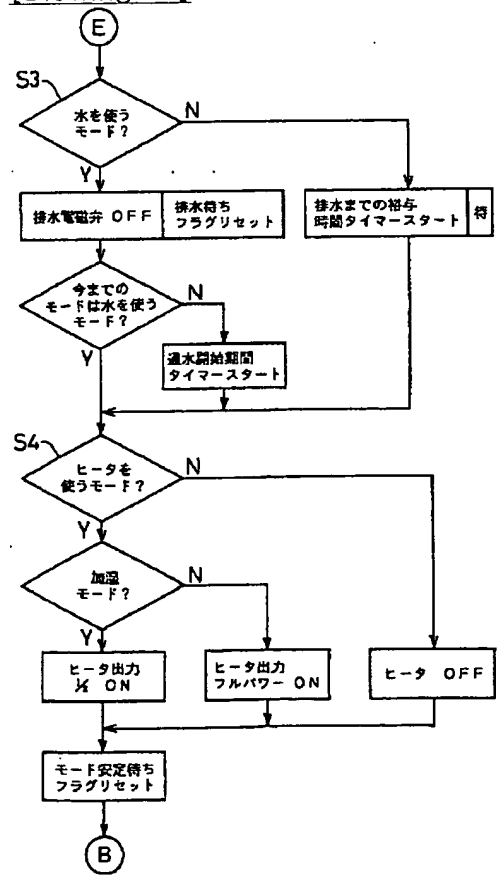
[Drawing 16]


処理1．ENTRY
電源キイ？
満水スイッチON？
排水タンクSW ON
ブザーON指令
今電源ON？
電源ON処理
電源OFF処理
キイ．イベントフラグリセット
EXIT
ブザーON指令
モード選択キイ？
モードLED切換
5秒タイマースタート待
風量キイ？
今除湿モード？
風量LED弱のまま
風量LED切換
風量LED(強中弱)と運転モードにより5段階のいずれかと選択指令
風向キイ？
冷風向を使うモード？
今風向モータON
オートルーバーLEDをOFF
風向モータをOFF
オートルーバーLEDをON
風向モータをON
切りタイマーキイ？
タイマーLED切換ローテイト(OFFも含む)
タイマー時間設定又は修正
今照明ランプON？
照明ランプOFF
照明ランプON
N
Y

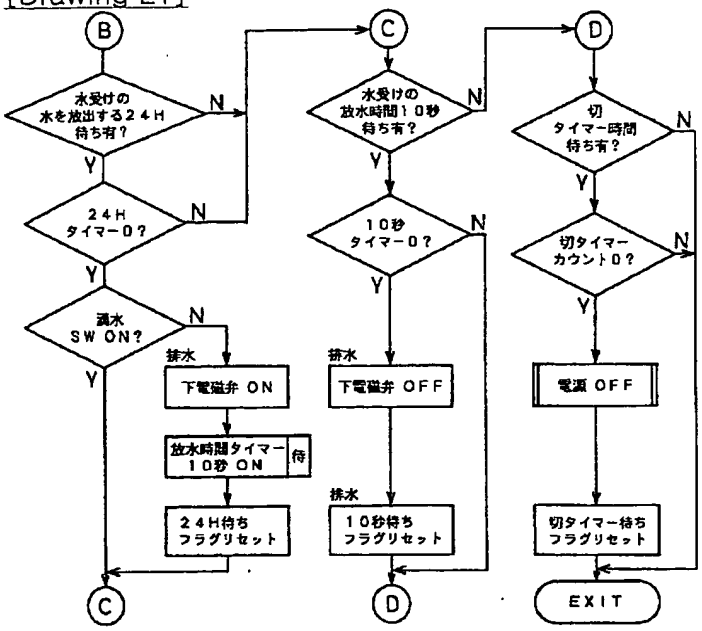
[Drawing 19]


処理3, ENTRY
モード安定待ち有？
N
Y
5ｓｅｃタイマー０？
N
Y
S1
冷風口を使うモード？
N
Y
風路冷風SW ON？
N
Y
風流モータ ON
EXIT
風路温風 SW ON？
N
Y
風流モータ ON
EXIT
A
排水沿与5M待ち有？
N
Y
5分タイマーカウント０？
N
Y
排水電磁弁 ON
排水待ちフラグリセット
B
S2
コンプレッサーを使うモード？
N
Y
エバポレイター管温≧0℃？
N
Y
今コンプレッサーON？
N
Y
コンプレッサーOFF
3分タイマースタート
今コンプレッサーON？
N
Y
3分タイマー０？
N
Y
コンプレッサーON
EXIT
今コンプレッサーON？
N
Y
E

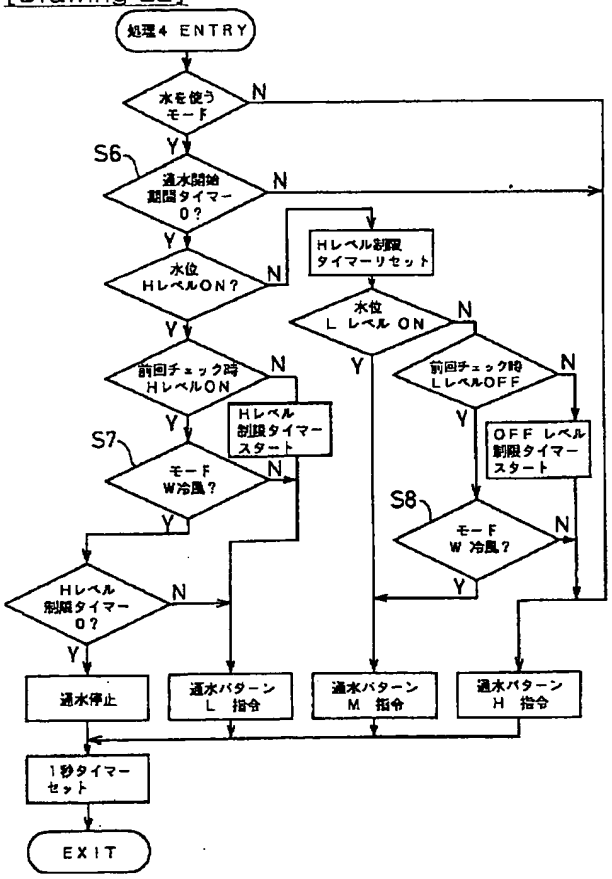
[Drawing 20]


E
S3
水を使うモード？
N
Y
排水電磁弁 OFF
排水待ちフラグリセット
排水までの沿与時間タイマースタート
待
今までのモードは水を使うモード？
N
Y
通水開始期間タイマースタート
S4
ヒータを使うモード？
N
Y
加湿モード？
N
Y
ヒータ出力½ ON
ヒータ出力フルパワー ON
ヒータ OFF
モード安定待ちフラグリセット
B

[Drawing 21]



[Drawing 22]



[Translation done.]